

Leopold Center



A NEWSLETTER OF THE LEOPOLD CENTER FOR SUSTAINABLE AGRICULTURE VOL. 23 NO. 2 SUMMER 2011

Nationwide search begins for Center director

Iowa State University has begun a nationwide search for the next director of the Leopold Center.

ISU President Gregory Geoffroy appointed Sharron Quisenberry, ISU Vice President of Research and Economic Development, to chair the search committee. Four ISU faculty who are familiar with the Leopold Center are on the search committee, as well as four members of the Leopold Center Advisory Board, which represents various sectors including Iowa's public and private universities, state agencies and several farm organizations.

Members of the committee are:

- Bill Ehm, water policy coordinator, Iowa Department of Natural Resources, and Leopold Center Advisory Board member;
- Dan Frieberg, West Des Moines

businessman and advisory board member;

- Matt Helmers, ISU associate professor of agricultural and biosystems engineering;
- Catherine Kling, ISU professor of economics and head of the Resource and Environmental Policy Division, Center for Agricultural and Rural Development;
- Matt Liebman, Henry A. Wallace Endowed Chair for Sustainable Agriculture and ISU professor of agronomy;
- Ann McCarthy, ISU state relations officer;
- James Russell, ISU professor of animal science;
- Jennifer Steffen, chair of the advisory board, and Birmingham farmer; and

DIRECTOR (cont. on page 4)

Research at Bear Creek goes beyond buffers

By AMYTHOMPSON, *Communications intern*

Bear Creek Watershed, a nationally recognized demonstration in Story County that began with support from the Leopold Center, has 20 years of research under its belt. The work done there involves riparian buffers and how they benefit the surrounding land and water.

Two recent Leopold Center research projects conducted near Bear Creek are the focus of three new On the Ground videos, "Farming for Untroubled Waters." The short videos can be found on the Leopold Center website and on Iowa State's channels at iTunesU and YouTubeU.

More than two million miles of riparian buffers have been planted along U.S.

streams and waterways. Most areas are no more than 60-80 ft. wide, with diversified plantings of native trees, shrubs and grasses. Above ground, plant biomass slows the flow of water into streams and stabilizes stream banks. Below ground, plant root systems use nutrients carried by runoff from crop fields and filter water before it enters streams.

"We know that riparian buffers work very well to keep sediment and nutrients from runoff out of streams," said Leopold Center Ecology Initiative Coordinator Jeri Neal. "But we tend to lose the advantage of their below-ground root systems by running tiles under them. We need

BEAR CREEK (cont. on page 10)

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LEOPOLD CENTER

LEOPOLD LETTER MISSION

The mission of the *Leopold Letter* is to inform diverse audiences about Leopold Center programs and activities; to encourage increased interest in and use of sustainable farming practices and market opportunities for sustainable products; and to stimulate public discussion about sustainable agriculture in Iowa and the nation.

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The Leopold Center for Sustainable Agriculture seeks to identify and reduce adverse socioeconomic and environmental impacts of farming practices, develop profitable farming systems that conserve natural resources, and create educational programs with the ISU Extension Service. It was founded by the 1987 Iowa Groundwater Protection Act. The *Leopold Letter* is available free from the Leopold Center at 209 Curtiss Hall, Iowa State University, Ames, Iowa 50011-1050; (515) 294-3711.



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Research Results

On the Web: www.leopold.iastate.edu/research/topics.html

Summaries

Easy-to-read summaries are available for these recently completed projects funded by Leopold Center competitive grants. Find them on our Research Results web page.

- Pottawattamie County Farm to Fork (Phase III)
- Evaluation of greenhouse gas emissions from three dairy production systems in Iowa – conventional, grazing and combination conventional/grazing
- High-tunnel resource manual and producer resource kit providing the tools for profitability
- Experiential educational engagement with working groups and communities of practice
- A feasibility study for the creation of a meat processing training program in Iowa
- Optimizing legume establishment in winter cereal grains
- The impact of biodiversity services in row crop production in annual versus perennial landscapes
- Reducing pesticide use in Iowa vineyards: Alternatives to herbicides for vineyard weed management
- Feasibility of unheated large gutter-connect greenhouses for winter organic vegetable production in Iowa
- Distillers Dried Grains (DDG) feeding and impacts on meat quality for grazing steers
- Adapting land retirement programs in response to Iowa's changing economy

Scientific Journals

Leopold Center-supported projects have produced these papers, recently published in peer-reviewed journals. Check at a research library or the journal's website for an abstract or full report.

- Tyndall, John, Lisa Schulte, Richard Hall and K. Gruhb (2011) Woody Biomass in the U.S. Cornbelt? Constraints and Opportunities in the Supply from Two Regions. *Biomass and Bioenergy* 35:1561-1571.
This is from a two-year Leopold Center ecology competitive grant to study wood-based feedstock supply in Iowa to supply fiber for bioenergy fuel and other biobased products. [E2009-26]
- Williams, C.L., Matt Liebman, Paula Westerman, J. Borza, D. Sundberg and B. Danielson (2009) Over-winter predation of *Abutilon theophrasti* and *Setaria faberi* seeds in arable land. *Weed Research* 49(4):439-447. DOI: 10.1111/j.1365-3180.2009.00715.x
This summarizes the research plots set up in 2004 to study weed seed management. The work has continued as a Leopold Center research team on low-external input rotations. [E2004-06]
- Sharma, Amit, Mary Gregoire, and Catherine Strohbehn (2009) Assessing Costs of Using Local Foods in Independent Restaurants. *Journal of Foodservice Business Research* 12(1):55-71. DOI: 10.1080/15378020802672089
- Alfnes, Frode and Amit Sharma (2010) Locally produced food in restaurants: Are the customers willing to pay a premium and why? *International Journal of Revenue Management* 4 (3/4): 238 DOI: 10.1504/IJRM.2010.035955
Both papers stem from a two-year Leopold Center marketing grant to Iowa State University for research on whether serving food purchased from local sources put restaurants at a competitive advantage. [M2005-17]
- Schmidt, Nicholas, Matt O'Neal and Lisa Schulte Moore (2011) Effects of grassland habitat and plant nutrients on soybean and natural enemy populations. *Environmental Entomology* 40(2): 260-272.
This was a three-year study associated with the prairie strips research at the Neal Smith National Wildlife Refuge in Jasper County. [E2006-13]

Conversations

WITH INTERIM DIRECTOR MARK HONEYMAN



Give and take cycles and the Center's focus

For many years, I have been a consumer of the Leopold Center. My projects relied on Leopold Center funding. The Leopold Center provided sustainability education and leadership. Leopold Center reports, publications, conferences and speakers filled my professional thought processes. I was a Leopold Center "taker."

Now is the time to give back. The call came to help out as interim director and the answer had to be "yes, how can I help?" I have suddenly become a Leopold Center "giver." It is a pleasure and an honor to have this chance because of the deep respect that the Center generates.

When I met with the Leopold Center staff we talked about three things. First was **stability**. In the waves of recent change at the Center, stability was important. Second was **focus**. The Center will focus on its first priority – developing, delivering and awarding the 2011 grants program. The resources of the Leopold Center have never been needed more. And third, **professionalism**. The Center will work as a cohesive team of professionals to keep

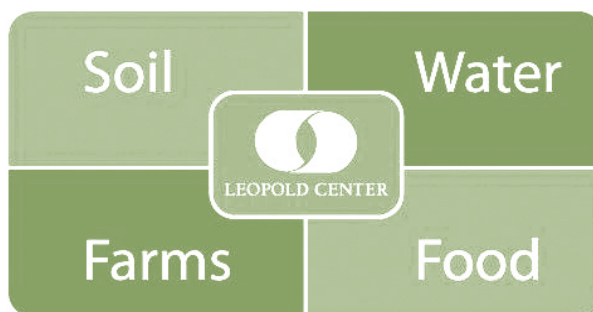
the Leopold Center light shining brightly.

Institutions are like a lot of things. There is give and take, ebb and flow, stability and change, constancy and uncertainty. Those in agriculture understand cycles because they are the way of nature – spring and fall, planting and harvest, dormancy and growth, birth and death. And so here we are in a "give and take" cycle...and it all continues.

As a result, I have been thinking a lot more about the sustainability and resiliency of Iowa agriculture lately and the role of the Leopold Center. After listening, reading, observing and distilling all of this, I have developed a schematic of the Leopold Center's scope (shown). The diagram has four

equal parts – soil, water, farms and food with the Leopold Center intersecting each. For me, this represents the Leopold Center's key areas of concentration. As we prepare for the next director, this will be the Center's focus.

Mark Honeyman



Center issues 2011 Request for Pre-Proposals

The Leopold Center is looking for innovative ideas that will help fulfill its mission to identify and reduce negative environmental and socio-economic impacts of agricultural practices and contribute to the development of profitable farming systems that conserve natural resources.

Specifics are outlined in the Leopold Center's 2011 Request for Pre-proposals (RFP) that is part of its long-running competitive grants program. The deadline for submitting ideas, in the form of a 2-3 page concept paper, is August 15, 2011.

The Leopold Center seeks these long-term outcomes:

1. Water and Soil: Water resources that increase in quality and quantity over time; improved soil health that ensures long-term productivity and crop yields.

2. People: Agricultural systems that yield multiple benefits (for people, ecology and profit) and create more opportunities and vibrant communities on the land.

3. Energy: On-farm energy conservation that is increased with the use of low external input systems and innovative energy systems relying on fewer outside energy inputs.

4. Land Management: Practices that enhance the integrity and adaptability of biotic communities and encourage agricultural production systems that anticipate and adapt to greater weather variability.

The Center will accept pre-proposals from investigators representing any Iowa nonprofit organization/agency and/or educational institution, including soil and water conservation districts, schools

and colleges and regional development groups. Farmers, landowners and farm-based businesses are encouraged to participate in the pre-proposal process.

Each of the Center's four initiatives – ecology, marketing and food systems, cross-cutting (water, energy, soil and alternative farming systems) and policy – are participating in the RFP.

The RFP can be downloaded from the Center's website. Hard copies can be obtained from the Center office by calling (515) 294-3711 or emailing leocenter@iastate.edu. Inquiries should be directed to the appropriate initiative coordinator.



Leopold Center fosters growing use of hoop barns

By MELISSA LAMBERTON, Communications research assistant

The Leopold Center's new interim director Mark Honeyman knows firsthand the opportunities that can arise from grants awarded by the Center. In 2004, he led a project team that received \$20,000 to build a hoop barn for feeding beef cattle – one of the first in the state. Seven years later, hoop structures for beef production abound in Iowa, and pioneering work by the Iowa State University team led the way.

Honeyman was appointed interim director of the Leopold Center in March 2011. A professor of animal science, he has worked at ISU for more than 30 years. He is the longtime coordinator of ISU's nine Research and Demonstration Farms, and recently accepted the position of associate director at ISU's BioCentury Research Farm. As a graduate student, he served on the original steering committee that helped shape the Leopold Center in the 1980s.

"I think the Leopold Center frequently is a spark, an igniter, a trigger for innovative work in agriculture in Iowa," he said.

Honeyman's own research embodies that kind of impact. Beginning in the mid-1990s, Iowa farmers began considering hoop structures – open-ended structures created by stretching tarp over curved trusses – as alternative housing systems for livestock, primarily hogs. Honeyman and a team of ISU researchers became involved in the early stages of this research with the Leopold Center-funded "Hoop Group" in 1997.

With promising results from swine studies, a second Hoop Group – which

included ISU Extension field specialists Shawn Shouse and Darrel Busby, ag research specialist Dallas Maxwell, and ag engineer Jay Harmon – turned their attention to beef cattle production in 2004. The team built a pilot hoop barn at the ISU Armstrong Research and Demonstration Farm near Lewis, and compared it to an open feedlot with a shelter in a three-year study. They concluded that both systems resulted in similar cattle performance, making hoop barns a viable alternative for feeding beef cattle with reduced environmental impacts.

The major benefit of hoop barns, in addition to their affordability and versatility, is that their half-moon profile deflects rain, meaning less runoff and less pollution. That could help farmers meet state and federal regulations for reducing the nutrients in runoff from feedlots that reaches streams and groundwater. Additionally, deep bedding in the structure, like cornstalks or other crop residue, helps absorb urine and captures manure for easier handling.

Honeyman credits the Leopold Center for being the first to commit to the beef hoop barn project. That allowed the Hoop Group to leverage other funds from the Iowa Cattlemen's Foundation, the Iowa Beef Center, the U.S. Department of Agriculture, the Wallace Foundation, and private cattle feeders. In addition to numerous articles in the press, the pilot barn had more than 5,000 visitors from eight states and five countries. Furthermore, the Leopold Center

encouraged the multi-disciplinary team approach that helped the project succeed.

When Honeyman and Harmon completed a survey of Iowa's hoop structures in 2010, they discovered their research made a significant impact. Farmers currently use 680 hoop barns for beef cattle production. Of these, 83 percent are used for feeding

cattle in bedded confinement, following the model that the ISU team established in their pilot project. The survey estimates that hoop barns now account for about 15 percent of the beef cattle fed in Iowa annually.

Honeyman points out that this increase in hoop barns is happening for environmental, not economic, reasons. Hoop barns cost slightly more than conventional feedlots for similar cattle performance. Honeyman explains that the research gave farmers "a new choice on the menu" for meeting the demands of regulations and concerns about feedlot runoff, as well as helped facilitate a shift to more environmentally-conscious meat production in Iowa.

The Hoop Group continues to study livestock production alternatives. The team's current study examines the optimum density of cattle in a bedded hoop barn. Honeyman plans to keep the Leopold Center focused on providing grant funds and acting as "the spark for new ideas in Iowa agriculture."

"This is all possible because of the Leopold Center," Honeyman said. "You do things that help make changes possible. You never know what people will be touched by a Leopold Center research and demonstration project."

APPLICATIONS FOR DIRECTOR DUE OCT. 1

DIRECTOR (continued from page 1)

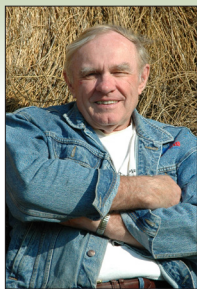
- Keith Summerville, associate professor of environmental science and policy and associate dean, Drake University College of Arts and Sciences, and advisory board member.

Applications for the position are due October 1. On-campus interviews are expected to be held in November. After the search process concludes, President Geoffroy will select the director from a list of candidates provided by the advisory board, as outlined in the Iowa Groundwater Protection Act that established the Leopold Center.

The position description is similar to what was used in the 2009 search, and can be viewed on the Leopold Center website at: www.leopold.iastate.edu/director_search.html.



Cattle gather beneath the pilot hoop barn near Lewis.



TOWARD A SUSTAINABLE

Future

Getting to resilience - reordering our priorities

If we pursue limitless “growth” now, we impose ever-narrower limits on the future. If we put spending first, we put solvency last. If we put wants first, we put needs last. If we put consumption first, we put health last. If we put money first, we put food last. – Wendell Berry (2010)

In his new book, *What Matters? Economics for a Renewed Commonwealth* (highly praised in the Forward by world-renowned economist Herman E. Daly), Wendell Berry suggests that if we want to live in a resilient, sustainable world – let alone leave one for future generations – we must begin reordering the central priorities of our culture. This collection of essays (some written recently, some published in the 1980s) provides us with a powerful and practical blueprint for radically rethinking the way we live on our lovely planet earth, assuming we care to be here much longer.

How we produce our food and characterize the relationship between nature and agriculture is at the heart of many of the priorities we need to reconsider. As Berry puts it, “we have allowed, and even justified as ‘progress’ a fundamental disconnection between money and food,” which leads us to the untenable conclusion “that if we have money we will have food, an assumption that is destructive of agriculture and food.” This conclusion has allowed both farmers and consumers to ignore the care of the essential resources of a resilient, sustainable food system, and encourages our destructive behavior. It has led us to the wholesale conclusion that “the world is conformable to our wants and we can be whatever we want to be.” It concludes that we are, as Aldo Leopold put it, the “conquerors” of the land community instead of acknowledging that we are simply “plain members and citizens.”

The exclusively money-driven food system journey we have been on for more than a century has taught us that Berry’s vision for a new economy, which puts community ahead of commodities, is “unrealistic.” But the more we contemplate the state of the world, the more it becomes apparent that we need to consider a different conversation based on new principles. Continuing to pursue our current priorities ultimately leads us to the “disastrous stupidity” (as Daly puts it) of selling a “bet on a debt as an asset.” This deeply flawed perspective fueled the recent Wall Street fiasco, to the great detriment of the entire global economy. It is now painfully apparent that this global economic disaster is contributing to the civic unrest spreading throughout the world. It is also increasingly apparent that the lack of food security often lies at the heart of that justifiable unrest.

Accordingly, the new food ethic that now needs to be incorporated into all of our “sustainable” food conversations must be expanded beyond the need to make healthy, affordable and

satisfying food available for ourselves. We need to create a new economy that empowers citizens *everywhere* to achieve those same goals while at the same time attending to the moral obligations and practices that restore the land health essential to food “sustainability” for future generations.

This new ethic must be incorporated into our concept of a “free market.” As Berry notes, in our current economic culture the word “free” “has come to mean unlimited economic power for some, with the necessary consequences of economic powerlessness for

others” – a culture that has spurred incredible destruction of both people and land. Farmers have suffered hardships from this version of the free market all too often, for far too long.

Amartya Sen, Lamont University Professor at Harvard, reminds us that this interpretation of the free market

has emerged because of the “impoverishment” of recent modern economics resulting from “the distance that has grown between economics and ethics.” Sen proposes that economics “can be made more productive by paying greater and more explicit attention to the ethical considerations that shape human behavior and judgment.” Had Wall Street adopted that principle as a priority, the world might be in much less of an economic mess than it is today! Sen suggests that “economic issues can be extremely important for ethical questions, including the Socratic query, ‘How should one live?’” That brings us right back to the heart of Berry’s thesis. How do we achieve a “community economy” that includes a “sharing of fate” and “assures an economic continuity and a common interest”?

A human economy based on such shared values would lead us closer to the kind of “economics” that Aristotle envisioned: “the art of efficiently producing, distributing and maintaining concrete use values for the household and community over the long term” (Daly). Such a priority lies at the heart of any serious “sustainable” food system.

Richard Karchmann

Berry, Wendell, 2010. *What Matters: Economics for a Renewed Commonwealth*, Berkeley: Counterpoint Press.

Sen, Amartya, 1987. *On Ethics and Economics*. Malden, Mass: Blackwell Publishers.

Bioreactors show promise for improving water quality

By MELISSA LAMBERTON, Communications research assistant

Matthew Helmers and Laura Christianson face a daunting question: How can Midwest farmers protect waterways from nitrate, a pollutant that is a local and national problem? The answer: harness microbes to do the hard work. The initial results of an ongoing research project suggest that denitrifying bioreactors can remove nitrate from tile-drained fields while remaining compatible with farming practices.

Christianson, a Ph.D. candidate in Agricultural and Biosystems Engineering at Iowa State University, discussed the benefits and challenges of bioreactors in a webinar hosted by Iowa Learning Farms on May 18. The project, currently led by Matthew Helmers, associate professor in ISU's Department of Agriculture and Biosystems Engineering, has been funded by the Leopold Center since 2009. Former ISU associate professor Alok Bhandari, now at Kansas State University, initiated the research.

Subsurface drainage makes Iowa's productive fields possible, but also impacts Iowa's water quality, in particular by carrying nitrate into streams and rivers. The Environmental Protection Agency (EPA) lists the Cedar River watershed in northern Iowa as impaired because of high nitrate levels, which raise concerns about exceeding the drinking water standard.

On a national scale, the Midwest contributes heavily to the growing hypoxic zone in the Gulf of Mexico. Nitrogen from fertilizers moves into the Mississippi River system and eventually arrives in the Gulf, where it causes explosive algae growth. This depletes oxygen and creates a "dead zone" that significantly impacts the region's ecology and fishing-based economy. The EPA has called for a 45 percent reduction in the nitrogen delivered annually to the Gulf by 2015.

Helmers and Christianson are examining how denitrifying bioreactors might be used to reach that goal. Bioreactors capture nitrogen-laden water from underground tile drainage and deliver much cleaner water to Iowa's streams and rivers. Bioreactors are deep trenches filled with a carbon source, such as wood chips, and installed along the edges of fields. Control structures direct water from tile drainage through the bioreactor, and a bypass line ensures that water won't back up during high flow events.

Christianson said the idea is to create "a vacation resort" for beneficial soil microbes. If provided with carbon food and denied oxygen, the microbes will breathe by transforming nitrate into dinitrogen gas (N_2), a harmless atmospheric gas.

"Denitrifying bacteria are doing this natural process, which we can harness for water quality purposes," Christianson said. "They are the workhorses of this whole system."

The investigators constructed three small-scale pilot bioreactors for controlled experiments at ISU's Agricultural Engineering/Agronomy Research Farm near Boone. They also partnered with the Iowa Soybean Association to analyze data from two field-scale bioreactors, and worked with Coldwater Palmer Watershed Group to design, install and monitor a third device. Initial results from the pilot bioreactors suggest that beneficial bacteria can reduce nitrates by 30 to 70 percent in water that spends four to eight hours flowing through the wood chips. Longer retention times result in higher levels of nitrate removal.

One challenge to this new technology stems from its success. When nitrate-breathing bacteria remove too much nitrate from the system, they are quickly outcompeted by sulfate-breathing bacteria.



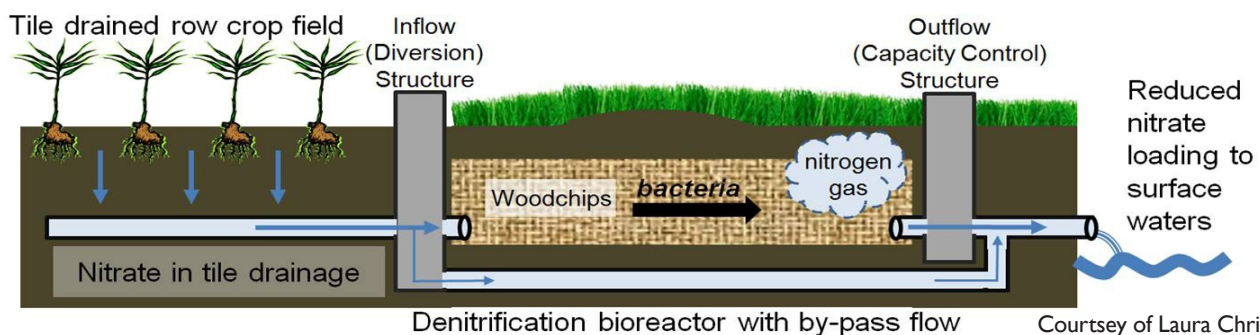
Laura Christianson collects a sample from the outflow control structure at the Northeast Research Farm bioreactor.

These unwanted bacteria utilize the wood chips for food and produce small levels of hydrogen sulfide. According to University of Illinois researchers, their activity corresponds with increases in the methylated form of mercury, a toxin that accumulates in fish and mammal tissue.

Christianson expects that these negative side effects can be minimized by managing the bioreactor with quicker flow rates, so that not all the nitrate is removed. Scientists can determine how to adapt the flow by periodically collecting grab samples to analyze. In the field, Christianson knows right away if too much nitrate has been removed, because the outlet control structure smells like hydrogen sulfide.

The investigators stress that the technology merits further research. They plan to continue analyzing data from field-scale bioreactors, which organizations like the Iowa Soybean Association are beginning to install around Iowa as demonstration sites. They also will conduct

BIOREACTORS (cont. on page 7)



Courtesy of Laura Christianson

BIOREACTORS (continued from page 6)

an acceptability survey among farmers.

"This is an exciting chance for me as an engineer to get out of my comfort zone and explore the social science side of water quality," Christianson said.

A major benefit of bioreactors is their compatibility with farming practices. They can be installed at the edges of fields and fitted into existing grass buffers, so no land needs to be taken out of production. Christianson estimates that a bioreactor can last 10 to 20 years with little maintenance and no energy inputs beyond the initial installation. They work best at a small scale, draining 40 to 80 acres. The cost of installing a bioreactor for that acreage averages \$7,000 to \$8,000. In Iowa, the EQIP program offers a one-time payment that covers roughly half the cost.

"Bioreactors provide a very focused treatment for nitrate, and that can help us improve water quality locally and also nationally," Christianson said. "It provides one more tool in the toolbox."



This bioreactor was installed April 2009 at the ISU Northeast Research and Demonstration Farm, with additional support from Iowa State University, the Leopold Center and Coldwater-Palmer Watershed Improvement Association.

New working group considers land tenure and conservation efforts

By MARY ADAMS, Policy Initiative coordinator

Building on the success of the recently completed Sustainable Agriculture Land Tenure (SALT) project, the Leopold Center's Policy Initiative is collaborating with the Drake Agricultural Law Center on a new policy-oriented working group. Professor Neil Hamilton and staff attorney Ed Cox have organized two meetings for the group at the Drake Law Clinic in Des Moines. Representatives from nonprofit organizations, government agencies, Iowa State University, agribusinesses, Drake University, and farm groups have participated in the meetings.

The overall objective of the working group is to bring key stakeholders together to:

- discuss existing land tenure trends;
- examine these trends in the context of current public policy;
- analyze the impact of this contextual framework on land use decisions and the corresponding effects on the local and regional community and ecosystem; and
- identify possible Leopold Center policy projects that address the challenges and opportunities in relation to resilient land tenure policy in Iowa.

At the first meeting in March the group discussed conservation mechanisms, including regulations, voluntary programs, the use of private sector resources, and

the creation of a landowner collective. They considered the interlocking needs to enforce existing regulations, such as Soil and Water Conservation District soil loss limits, while continuing to support voluntary conservation programs. The need for better communications also was noted. There was a call for improved interactions among landowners, operators, and agencies, including the Natural Resources Conservation Service and soil and water conservation districts.

Enhanced communication between landowners and operators can be addressed in a property lease. Private parties might be employed to act as landowner advocates because they can provide tailored attention geared to the land and the landowners. Economics play a role here as some landowners, in particular investors and heirs, desire such a system but may not be willing to pay. (Currently, only about five percent of landowners take advantage of professional farm management services.)

Conservation Certifications could be a tool used to improve land and water quality. Agren, Inc. is in the process of developing such a program, based on operator certification. Again, this sort of program requires landowner knowledge of conditions on the farm and a desire for promoting conservation. Another

www.leopold.iastate.edu

Non-operator landowners:
[www.leopold.iastate.edu/
research/policy_files/
LTWG_042811.pdf](http://www.leopold.iastate.edu/research/policy_files/LTWG_042811.pdf)
Sustainable Agricultural Land Tenure:
www.sustainablefarmlease.org

possibility is creating an organization of landowners to act cooperatively to require conservation practices within a specific region or watershed.

The April meeting included a presentation from ISU rural sociologist J. Gordon Arbuckle featuring data from his latest landowner survey. The "Landowners and Operators Caring about the Land" (LOCAL) Report was conducted in cooperation with Agren and Iowa's Soil and Water Conservation Districts. The slideshow on non-operator landowners and conservation can be viewed on the Leopold Center website.

The group discussions focused on better understanding of the land tenure situation, organizational and technological resources available for addressing land tenure and stewardship, areas for cooperation, and expectations for what possible policy pre-proposals for the Leopold Center might look like.

Social networks vital for rural conservation efforts

By MELISSA LAMBERTON, Communications research assistant

When ecologists search for solutions to Iowa's natural resource management dilemmas, they usually study the land or water, examining how farming practices influence the soil, shape the watershed, and alter the ability of ecosystems to perform vital functions. Ryan Atwell took a different approach. He studied the farmers.

Atwell, who received a Ph.D. from Iowa State University's Department of Natural Resource Ecology and Management (NREM) in 2008, hoped to gain insights into how rural stakeholders value their countryside with the goal of developing better tools for conservation practices. ISU NREM associate professor Lisa Schulte Moore and Lynn Westphal from the U.S. Forest Service also worked on the project, which was partially funded by the Leopold Center's Ecology Initiative.

Atwell knew from the start that ecologists and farmers don't always see the world the same way. "I grew up in rural culture," he said. "I knew the ecologists' vision was a great ideal, but it wasn't going to be accepted by a lot of rural folks."

Corn Belt farmers feel pressure to increase row crop production to supply emerging biofuel markets. At the same time, ecologists emphasize the importance of leaving perennial cover on the landscape to protect ecosystem services like soil fertility, flood control, water quality and biodiversity. They encourage farmers to use targeted practices, such as crop rotations, riparian buffers or restored wetlands, to benefit the entire watershed.

This approach stems from the way ecologists envision the landscape as a network of rivers, connecting small local waterways to larger ecological systems. But Atwell discovered that rural stakeholders do not perceive their countryside in watershed terms. Instead, they identify strongly with networks of people.

Atwell investigated how rural stakeholders thought about conservation practices by conducting 33 interviews with 42 residents near Stanhope in Hamilton County. To his surprise, when he asked participants what they valued about the countryside, they answered primarily in social terms, telling stories about neighbors, community events, and their deep concern for disappearing homesteads and a diminishing way of life.

The results suggest that conservation

practices have not yet been integrated into the social networks that define rural culture and ethics. Interviewees generally approved of perennial cover crops because of perceived benefits for water and wildlife, but they did not place a high priority on them. Moreover, they felt unable to bring about change in large-scale landscapes and institutional systems.

At first, Atwell encountered reluctance from rural residents to participate. He initiated informal conversations at grain elevators and farm supply businesses, but had difficulty setting up interviews. Then, after a conversation at a local restaurant, members of a women's group took an interest in the project and referred him to several farmers. The experience reflects an important insight from the study data: conservation agencies need to connect their personnel with social networks to work successfully in rural communities.

"Given short-term economic constraints, there are few opportunities to inject new ecological thinking into the community at present," Schulte Moore said. "We need new models for how to work with farm communities on making landscape changes that benefit both them and the people living downstream."

The researchers discovered that rural farmers aren't likely to adopt new conservation practices unless a coordinated strategy exists at multiple levels, from individual farms to local communities to regional institutions. Initiatives that focus on achieving outcomes at only one scale aren't likely to create long-term change. On a small scale, for example, farmers showed a preference for conservation methods that mesh with farm practices, while on a large scale they wanted the government to offer trustworthy financial incentives.

"Oftentimes in conservation we get tunnel vision," Atwell said. "We focus on effecting change at just one level of the system.... Both farmers and policymakers said we need concerted change efforts that work across multiple levels of the system."

The researchers solicited the views of state leaders in agriculture, conservation and policy through a companion study, where they held a participatory workshop to determine what opportunities and challenges exist for making use of perennial vegetation. Iowa landscapes often fall into two extremes—conservation areas rigidly protected from disturbance, and farmland

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Read the Competitive Grant Report:
[www.leopold.iastate.edu/
research/grants/2010-1/brief/
E2006-20_brief.pdf](http://www.leopold.iastate.edu/research/grants/2010-1/brief/E2006-20_brief.pdf)



A rural church in Squaw Creek watershed

valued only for productivity. Almost all the participants spoke favorably about the ability of perennial cover to bridge the gap by blurring the distinction between working lands and protected areas.

Nevertheless, significant challenges remain to encouraging conservation with perennial cover. In Iowa, a highly interconnected socioeconomic and political structure, which includes many external inputs like fertilizers, crop technologies and government subsidies, creates a system of row crop farming that resists modification despite recognized disadvantages for rural communities and the environment. To bring about change, Atwell's research suggests, conservationists need to understand and foster social, economic and political networks that span both local and regional scales.

Atwell has gone on to develop incentive-based programs and environmental markets, and recently completed a fellowship with the U.S. Department of Agriculture through the American Association for the Advancement of Science. Schulte Moore is continuing her research with ISU graduate student Drake Larson, whose work focuses on practical tactics for change.

The research has appeared in *Ecology and Society*, *Landscape Ecology*, and *Land Use Policy*. The studies were funded by the Leopold Center's Ecology Initiative, USDA Sustainable Agriculture Research and Education (SARE), U.S. Forest Service Northern Research Station, ISU Department of Natural Resource Ecology and Management, and ISU Graduate Program in Sustainable Agriculture.

Value Chain Partnerships working groups transition to new leadership

By MELISSA LAMBERTON, Communications research assistant



From its inception, the Leopold Center has served as a catalyst and a convener to initiate new ventures and enterprises that become self-sustaining. These enterprises help fulfill the mission that the Groundwater Protection Act established for the Center in 1987 – to conduct research that informs and enhances sustainable practices, and disseminate that research to the public.

One such enterprise is the Value Chain Partnerships (VCP) project. Since its beginnings in 2002, VCP has operated throughout Iowa to foster communication and forge alliances among producers, processors, distributors, and consumers – all the links in the food chain. With the help of Craig Chase, interim coordinator for the Leopold Center's Marketing and Food Systems Initiative, working groups in the VCP program have begun the transition to be able to self-convene under new leadership.

Chase has longtime connections with the Leopold Center, reaching back to the tenure of the first director in 1988. An expert in the economics of regional food systems, Chase describes his work as “putting dollars and cents to the research.” He assumed responsibility for assisting the VCP working groups in making successful transitions, as well as other duties in the marketing initiative, in April.

VCP launched in 2002 when the W.K. Kellogg Foundation awarded the Leopold Center a \$560,000 grant to develop and direct the project. The Leopold Center soon leveraged additional funds from the SYSCO Corporation, the U.S. Department of Agriculture, and the Sustainable Agriculture and Research Education (SARE) program and other organizations. In 2006, the Henry A. Wallace Center became a major partner when it offered \$500,000 to cover three years of operation.

The sponsors hoped to develop self-

sustaining “communities of practice” that would bring together people with diverse backgrounds, develop innovative solutions for sustainability, leverage funds and even offer seed grants.

In the past, working groups convened under the umbrella of the VCP program coordinated by the Leopold Center. Each group will transition to a new leadership structure by the end of 2011 when the



Craig Chase

Leopold Center's funding ends. Groups can still receive support from the Leopold Center by applying for competitive grants.

The Regional Food Systems Working Group (RFSWG), a collaboration of 16 autonomous groups, will continue to convene under the Leopold Center's leadership until December when it finalizes its transition. Chase said that the RFSWG currently covers 83 of Iowa's 99 counties, and he hopes eventually every

county in the state will have a connection to a developing food system group. One notable success story took place in northeast Iowa, where a food co-op quadrupled its sales of locally grown products between 2006 and 2008.

The Pork Niche Market Working Group (PNMWG) will transition to the Iowa Pork Industry Center at Iowa State University to continue its work. The oldest of the working groups, the PNMWG began in 2002 with some of the W.K. Kellogg Foundation's original funding. The group supports various projects to address challenges in niche pork markets. In 2007, for example, the group secured funding to research how companies could improve their ability to sell all parts of the hog carcass. That led to the creation of Prime Pork Supply, a business-to-business entity that helps companies pool their excess product for sale. Two competing companies teamed up to distribute products to market and saved more than \$20,000.

Two working groups are already housed elsewhere. The Food Access and Health Working Group, formed in 2010 by a

Leopold Center competitive grant, functions in association with the Iowa Food Systems Council. Members have developed a comprehensive report on the resilience and health of Iowa's food systems.

The Farm Energy Working Group (FEWG) is stationed at the University of Northern Iowa's Center for Energy and Environmental Education. This group provides education and resources to farmers who want to reduce their use of fossil fuels, and offers small seed grants to help them get started. Because of the FEWG's funding, Greg Hoffman in Waterloo upgraded the insulation on his hoop house and installed a wood-burning boiler to heat it; and Jason Gomes in Waverly built a solar-powered curing/drying chamber – and wrote a manual so other farmers could follow suit. The FEWG received a competitive grant this year from the Leopold Center's Cross-cutting Initiative to continue work.

Plans for the remaining two groups, the Grass-Based Livestock Working Group (GBLWG) and the Fruit and Vegetable Working Group (FVWG), are still being developed. The GBLWG began in 2008 with three-year funding from a Leopold Center competitive grant. The FVWG began in 2007 and provides farmers with assistance and information such as the Post-Harvest Handling Decision Tool, a comprehensive web document that helps vegetable growers optimize their post-harvest handling.

“It's because of the work the individuals have done within these groups and the connections they've made between producers and buyers that these types of successes happen,” Chase said. He points to the Leopold Center's early guidance as a spark that allowed each group to pursue additional funds elsewhere. In many cases, the groups distribute that money to start smaller projects across the state, becoming catalysts themselves for new enterprises.

The VCP working groups characterize the heart of the Leopold Center mission – to explore alternatives in agriculture and work with partners to offer those options to Iowa farmers. “The hope is that they continue to move forward, and continue to learn from each other,” Chase said.

Resilience discussed at May 25 workshop

Farms need to be resilient as well as sustainable to continue producing food, fuel and fiber in an uncertain future marked by erratic weather due to climate change, rising energy costs and other unpredictable shocks in the system.

This advice comes from David Mortensen, professor of weed ecology at Pennsylvania State University, who spoke to more than 80 researchers and educators attending a May 25 workshop hosted by the Leopold Center. The participants learned about resilience and how it might be incorporated into Leopold Center-funded research and demonstrations.

"Resilience is the ability of a system to absorb disturbance and still have all the

essential elements it needs to function," Mortensen said. "We need to identify systems that are resilient and try to expand them."

Resilience arises from diversity. The concept offers a new – and slightly different – twist to sustainability. Laura Jackson, a biologist from the University of Northern Iowa, said: "In sustainability we talk about things running out slowly over time. The resilience idea introduces a new concept that because our systems are adaptive and complex, there is a potential for catastrophe to happen that is not directly related to running out of a natural resource."

Jackson addressed the social aspects of

resilience during a panel discussion. Other panelists were ISU agronomist Matt Liebman, Rowley farmer Richard Sloan, and local foods coordinator Bahia Barry. Richard Leopold, U.S. Fish and Wildlife Service Assistant Regional Director, moderated the panel.

Past, present and future grantees of the Leopold Center shared their ideas and research in poster sessions and during afternoon roundtable discussions.

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View videos, photos and posters:
[www.leopold.iastate.edu/
news/pastevents/resilience.html](http://www.leopold.iastate.edu/news/pastevents/resilience.html)

BEAR CREEK BUFFERS PROVIDE UNEXPECTED BENEFITS

BEAR CREEK (continued from page 1)

conservation combinations – upslope farmland practices that can be used with buffers – to give us the best bang for the buck."

Dan Jaynes, a soil scientist at the USDA's National Laboratory for Agriculture and the Environment, is studying what happens when tile drainage systems are connected to riparian buffers. A 1,000-ft. lateral line intercepts underground tile lines from a nearby crop field. The lateral line runs parallel to the stream, redistributing tile water throughout the buffer.

He said he hopes the system can divert 10 to 15 percent of the water from tile drainage, which would have gone directly into the stream. "That will take us a long way down the road to removing the critical peak of nitrate in water," he added.

The second research project looks at groundwater quality and riparian buffers, specifically the impact of perennial vegetation in areas upslope from buffers. Principal investigators are Tom Isenhardt, ISU Natural Resource Ecology and Management, and Keith Schilling from the Iowa Department of Natural Resources and Iowa Geological and Water Survey.

Isenhardt was among the original researchers at Bear Creek, along with colleague Dick Schultz. The buffers have changed with time, providing unforeseen benefits. For example, during the 2010 flood, there was little evidence of erosion

on parts of the buffered stream bank covered by grass or trees. The buffer also caught flood debris, so the farmer didn't have to deal with it in the crop field.

Isenhardt and Schilling will monitor groundwater quality at seven sites on a 10-mile stretch of Bear Creek, and they'll look at the effects of tile drainage on stream flow. The goal of the current research is to discover how riparian buffers can be combined with other conservation practices to become even more effective in managing water.

"Once these things are established, it's the other benefits that farmers see and perceive and enjoy," Isenhardt said. "The wildlife, aesthetics and quality of life are what will keep people, but the incentives are what will entice them to keep the systems on the ground."

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Watch the videos:
Farming for Untroubled Waters
[www.leopold.iastate.edu/
research/eco_files/ground.html](http://www.leopold.iastate.edu/research/eco_files/ground.html)

What buffers can do

Research has shown that buffers provide many benefits, including:

- sediment in runoff reduced by 70 to 95 percent;
- an increase in soil organic matter, fine root biomass and infiltration; and
- stream banks protected from erosion, even during large flood events.

Tom Isenhardt and Dick Schultz show a photograph of Bear Creek 20 years ago.



News & Notes

Leopold Center Distinguished Fellow Fred Kirschenmann was among a small group of sustainable agriculture leaders who met privately with Great Britain's Prince of Wales in Washington, D.C. on May 4. Prince Charles, an organic farmer and strong supporter of sustainable agriculture, was keynote speaker at a Future of Food conference hosted by the Washington Post at Georgetown University. Videos and other information from the event can be viewed at <http://washingtonpostlive.com/conferences/food>.

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The Leopold Center has prepared a guide for visitors to central Iowa who are interested in sustainable agriculture. The guide lists partners and programs at Iowa State University involved in promoting alternative practices and sustainability. Find it on the Leopold Center's FAQ webpage at: www.leopold.iastate.edu/about/tour.pdf.

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Malcolm Robertson, coordinator of the Leopold Center's Cross-cutting Initiative, is teaching a new summer class on Horticulture Enterprise Management (HORT 432MR). The class brings students to the ISU Horticulture Research Station near Ames to give them on-the-ground training in the management and operation of an Iowa fruit and vegetable enterprise.

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The Iowa State University Horticulture Department has hired a new assistant professor, Ajay Nair, to help large- and

small-scale growers of horticultural food crops (primarily vegetables). He recently received his Ph.D. in horticulture from Michigan State University, and holds degrees from the University of Maine and Kerala Agricultural University in Thrissur, India. His appointment is 60 percent extension, 30 percent research and 10 percent teaching. This is one of two new positions for local food systems research and education and food crop production supported by the Leopold Center in ISU's College of Agriculture and Life Sciences.

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A new update is available for Leopold Center's popular directory "Learning about Local." The publication includes 85 organizations, programs, funders and consultants that offer various forms of assistance for people interested in local food systems. You can download "Learning about Local" from www.leopold.iastate.edu/resources/guide/guide.pdf or request a print copy from the Center at (515) 294-3711.

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The Leopold Center is now accepting nominations for the 2011 Spencer Award for Sustainable Agriculture, which honors Iowans committed to sustainable practices on family farms. The distinguished award includes a \$1,000 cash prize. Anyone who has made advancements toward ecologically and economically sound farm practices can apply or be nominated. Nominations must be received by July 15. For nomination forms, visit www.leopold.iastate.edu/resources/spencer/spencer.htm or contact the Center at (515) 294-3711.

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Small-scale meat and poultry producers are benefitting from the work of the Niche Meat Processor Assistance Network, an Internet-based collaborative learning service that consolidates the resources of land grant universities. The group recently was featured by Food Safety News, a worldwide web-based daily newspaper. Co-leader of the group is Arion Thiboumery, vice president of Lorentz Meats in Minnesota and extension associate at Iowa State University. Thiboumery led the Small Meat Processors Working Group at ISU that was part of the Value Chain Partnerships project and is now incorporated into the national effort. More information is available at www.nichemeatprocessing.org.

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Keith Summerville, a member of the Leopold Center Advisory Board, has received the Madelyn Levitt Teacher of the Year award, Drake University's highest honor for inspirational teachers. Summerville is the associate dean of Drake University College of Arts and Sciences.

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A handbook for establishing and managing prairies on farmland, *Incorporating Prairies into Multifunctional Landscapes*, has been reprinted, and the updated version is available at no charge from ISU Extension's Online Store. Meghann Jarchow and Matt Liebman, supported by the Leopold Center's Ecology Initiative, developed the publication.

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ISU economist Dave Swenson has completed new research about local foods systems, supported by the Leopold Center's Marketing Initiative. His research focuses on how niche meat processors and local fruits and vegetables can positively impact rural economics. Read more at: www.leopold.iastate.edu/news/newsreleases/2011/051311_swenson.html.

New research assistant joins Leopold Center



Melissa Lamberton, an MFA candidate in ISU's Creative Writing and Environment program, joined the Leopold Center as

a research assistant in communications in May. She grew up in Tucson, Arizona and received a BS in environmental science from the University of Arizona.

Lamberton worked as the Education and Public Outreach Coordinator on NASA's Phoenix Mars Scout Mission,

which landed on Mars in 2008. She also wrote a history of the Lunar and Planetary Laboratory in Tucson, conducting interviews with over 50 scientists from the Apollo age to the present.

She became interested in riparian ecosystems after an internship in Costa Rica, where she wrote about how farming practices impact the rivers on which local communities rely. After graduation, she worked as a research assistant at the Water Resources Research Center in Tucson, before moving to Iowa to start graduate school. Her thesis work focuses on western water policy and river restoration.



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Highlight Events

Learn about how to get support for events: www.leopold.iastate.edu/news/support.html

Advisory board retreat

Facilitator Regenia Bailey of Iowa City leads discussion during a June 1 retreat for Leopold Center advisory board members and staff at Whiterock Conservancy near Coon Rapids. Topics included ways the Leopold Center could contribute to Iowa agriculture in the next decade, qualities of the next Leopold Center director, and how the board would be involved in the selection process. Perspectives on current issues in Iowa's agricultural landscape were offered by Matt Liebman, Iowa State University; Mary Skopec, Iowa Department of Natural Resources; and Neil Hamilton, Drake University Agricultural Law Center.



Summer field days

Practical Farmers of Iowa, Iowa Learning Farms and ISU Research and Demonstration Farms all have great lineups of field day events, many of which feature cooperators who are conducting Leopold Center research. Find all the schedules on the Leopold Center website calendar.

Beneficial insects

Farmers, organic growers, conservationists and gardeners are invited to attend a one-day workshop on August 4 about how to conserve beneficial insects with native plants. Participants will examine insect specimens, learn about conservation programs and visit the Field Extension Education Laboratory. Register by July 15 at www.aep.iastate.edu/ent. For inquiries, contact Kelly Seman (kaseman@iastate.edu) from the ISU Department of Entomology and Natural Resource Ecology and Management. The workshop is supported by a Leopold Center research grant.

More details, events

Check Leopold Center Web calendar:
www.leopold.iastate.edu/news/events.html

Greenhorn Grazing

This workshop series will take place this summer and fall for the third year, hosted by Iowa State University Extension livestock specialist Joe Sellers. Cost of the program is offset by grants from the Leopold Center, Iowa Beef Center, Southern Iowa Forage and Livestock Committee and Dow AgroSciences. For more information about this introduction to management intensive and rotational grazing, contact Sellers at the Adams County Extension office, (641) 322-3184.

Landscape biomass farm tour

Learn more about a Leopold Center-funded project, Developing a Portfolio of Sustainable Bioenergy Feedstock Production Systems, at a field day in Luther on August 5. The agenda includes time for the research team to discuss their progress in biomass production systems research and future opportunities. Check our events page for details.